

W5 Modelling Waterway & Wetlands: Development and application of stream and wetlands habitat suitability models to support Healthy Waterways Strategy planning.

Objective(s)

To combine best-available biological and spatial data to continuously improve models, tools and capabilities to support defensible, cost-effective prioritisation of management actions for waterways and wetlands taking into account future threats and risks to support the development and review of the Healthy Waterways Strategy

Why this research is important

Accurate spatial datasets of stream networks and waterbodies previously developed or improved by the MWRPP provide critical data for mapping, visualisation and performance reporting at multiple levels of aggregation. Environmental data libraries associated with stream networks and waterbodies spatial data provide a rich set of utility and environmental descriptors which are an ongoing research & management resource with multiple uses.

These data can be used to develop a range of tools such as HSMs and to drive applications such as formulating management actions, designing scenarios of interest, and action prioritisation to guide Healthy Waterways Strategy planning and target-setting.

These tools and capabilities support continuous improvement of HWS implementation by providing an advisory and critical review role in the MERI Framework and the Rivers, Wetlands and Estuaries Monitoring and Evaluation Plans (MEPs). They also support strategic activities such as HWS Mid-term Evaluation and forthcoming activities such as MW's Pricing Submission to the Essential Services Commission (~2026).

Contribution to Melb. Water research priorities

- MWRPP-8 (W1, W2, W5): Models and decision support tools to model the status of waterway and wetland environmental values, explore threats and likely future conditions & prioritise management interventions most likely to protect or improve waterway and wetland values
- MWRPP-13 (W6, W7, W11): Managing the impacts of climate change on the health of estuaries and wetlands

Approach

This research provides, maintains and improves foundational data, which in turn enables the development of models, tools and applications that

support high-resolution scenario exploration, strategic action planning and prioritization, and reporting.

Foundational data includes both biological (Macroinvertebrates, Native Fish, Platypus, Frogs and wetland-dependent birds) and spatial (HWS 2018 Stream Network + Data Library, MWSTR_v1.3 + Data Library, and Waterbodies_v1.3 + Data Library) information.

The tools and applications will cover: Planning Support for Biota Monitoring Programs, Habitat Suitability Models, Management Actions, Scenario Analyses and Action Prioritisation Analyses.

Key Outputs

- Macroinvertebrate database
- HWS 2018 stream network + Data Library; mwstr + Data Library & Waterbodies spatial data + Data Library.
- Habitat suitability models for instream & wetland-dependent biota.
- Potential management actions, associated costs & spatial variation.
- Action prioritisation analyses using Zonation.

Expected benefits

- Ability to predict habitat suitability of instream and wetland biota in streams and wetlands throughout the region.
- Better understanding of candidate management actions and determinants of where they are likely to be suitable/not suitable to apply
- Identification of the most cost-effective action at stream reaches or wetlands at landscape scale.
- Ability to explore management options of strategic concern from the perspective of stream or wetland biota habitat suitability.

Project teams

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